

COMMUNITY AFFAIRS

DIVISION OF CODES AND STANDARDS

Uniform Construction Code

Radon Hazard Subcode

Radon for Educational Group E Buildings

Proposed Amendments: N.J.A.C. 5:23-10.2, 10.3, and 10.4

Authorized By: Lieutenant Governor Sheila Y. Oliver, Commissioner, Department of
Community Affairs.

Authority: N.J.S.A. 52:27D-119 et seq.

Proposal Number: PRN 2020-070.

Calendar Reference: See Summary below for explanation of exception to calendar requirement.

Submit written comments by September 18, 2020, to:

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The agency proposal follows:

Summary

The Department of Community Affairs (Department) proposes amendments to the Uniform Construction Code (UCC), N.J.A.C. 5:23, related to the construction of Educational Group E buildings in the Radon Hazard Subcode. Educational Group E buildings are an occupancy classification, defined by the International Building Code (IBC) and adopted by reference in the UCC, that includes schools and day cares. The New Jersey Department of

Environmental Protection (DEP), the State agency that regulates the hazard level for radon, has asked the Department to revisit the construction techniques of the Uniform Construction Code within N.J.A.C. 5:23-10, the Radon Hazard Subcode, in recognition that the increasing complexity of modern school design necessitates more flexibility in the standards to ensure safety goals are met. In coordinating efforts, the U.S. Environmental Protection Agency (EPA) and the New Jersey School Development Authority (SDA) were also consulted. This rulemaking provides a combined effort to update the construction techniques for Educational Group E; this rulemaking does not amend the Residential Group R techniques. The ANSI/AARST CC-1000-2018, Soil Gas Control Systems in New Construction of Buildings, was used as the basis for the changes. This standard provides minimum requirements for the construction of any building intended for human occupancy, except for one- and two-family dwellings, in order to reduce occupant exposure to radon and other hazardous soil gases. The applicable provisions of this standard for Group E buildings are proposed in accordance with N.J.S.A. 52:27D-123a.

A section-by-section description of amendments follows:

1. At N.J.A.C. 5:23-10.2, Definitions, the definitions of “perforated pipe,” “radon collection mats,” and “soil gas vent pipe” would be added.
2. At N.J.A.C. 5:23-10.3, Enforcement, amendments would update language in order to accurately refer to the newly created subsections at N.J.A.C. 5:23-10.4, Construction techniques.
3. Proposed new N.J.A.C. 5:23-10.4(b) would stipulate standards for radon hazard protective features in the construction of Group E buildings in tier one areas, both to minimize entry of radon into structures, as well as to allow for postconstruction radon removal. The new subsection does not preclude voluntary implementation of even more stringent techniques. Additions to existing relevant structures are not required to abide by these techniques, but

reasonable efforts to include them should be made. Because the rulemaking is decoupling Group E and Group R radon construction techniques, it is necessary to add the introductory language found at existing subsection (b) to the new subsection.

4. Proposed new N.J.A.C. 5:23-10.4(b)1 would require the installation of a base course beneath buildings' slabs and foundations. This base course would rest beneath a soil gas vapor barrier, which must be of an approved material and free of defects and repaired or replaced if not. The paragraph further allows for alternative soil gas collection areas, such as sealed crawlspaces.

5. Proposed new N.J.A.C. 5:23-10.4(b)2 would require the damp- or waterproofing of foundation walls and floors in contact with the soil in accordance with Section 1805 of the building subcode.

6. Proposed new N.J.A.C. 5:23-10.4(b)3 would stipulate that the path for soil gas flow between the base course and the vent in the roof must be unobstructed.

7. Proposed new N.J.A.C. 5:23-10.4(b)4 would explicate the technical specifications and configuration of the pipes used for soil gas collection. The new paragraph would also allow for alternative approved soil gas collection materials or methods.

8. Proposed new N.J.A.C. 5:23-10.4(b)5 and 6 would require that inappropriate openings in system components or structural gaps and seams are sealed with approved materials.

9. Proposed new N.J.A.C. 5:23-10.4(b)7 would require closure between the base course and the exterior foundation drain systems to prevent air migration of soil gases.

10. Proposed new N.J.A.C. 5:23-10.4(b)8 would require that the various forms of masonry units provide a barrier between soil gases and interior spaces.

11. Proposed new N.J.A.C. 5:23-10.4(b)9 and 10 would stipulate the specifications for sumps to ensure the efficacy of radon minimization systems.

12. Proposed new N.J.A.C. 5:23-10.4(b)11 and 12 would explicate the technical specifications of vent pipes, as well as the configuration of the vent pipes required to ensure proper exiting of soil gases from buildings. The new paragraphs would further require labeling on exposed or otherwise visible vent pipes in order to differentiate between gas and water pipes.

13. Proposed new N.J.A.C. 5:23-10.4(b)13 would require each vent pipe to have an electrical junction box located nearby to allow for the possibility of future installation of radon fans.

14. Recodified N.J.A.C. 5:23-10.4(c) is proposed for amendment to distinguish between the treatment of Group E buildings (in proposed new subsection (b)) and Group R buildings; there is no substantive change to the existing text.

As the Department has provided a 60-day comment period on this notice of proposal, this notice is excepted from rulemaking calendar requirements pursuant to N.J.A.C. 1:30-3.3(a)5.

Social Impact

The proposed amendments to the Radon Hazard Subcode are expected to have a positive social impact. This rulemaking will ensure that the radon minimization techniques utilized in the construction of educational buildings are of the highest standard and will, therefore, produce an increased level of assurance among occupants of these buildings that their surroundings are healthy and free of toxic gases.

Economic Impact

The proposed amendments update radon hazard protective features in the construction of Group E buildings. Post-construction radon mitigation of school buildings is expensive; the amendments will ensure that the most efficacious systems possible are installed from the start. Moreover, many of the requirements are the same as those in the existing code, and the additional requirements are anticipated to save money because they allow for the installation of fewer vent pipes.

Federal Standards Statement

No Federal standards analysis is required because the proposed amendments are not being proposed under the authority of, or in order to implement, comply with, or participate in any program established under Federal law or a State statute that incorporates or refers to Federal law, standards, or requirements.

Jobs Impact

The proposed amendments address radon hazard protective features and are not expected to have an impact on the creation or loss of jobs, as the implementation of the amendments will be executed in the ordinary course of construction.

Agricultural Industry Impact

The Department does not anticipate that the proposed amendments would have any effect on the agricultural industry.

Regulatory Flexibility Analysis

The proposed amendments address radon hazard protective features in the construction of Group E buildings. The intent of this rulemaking is to ensure that systems for soil gas removal in educational buildings meet the most current national standards. This rulemaking affects construction companies and contractors, many of whom would be considered small businesses as defined by the New Jersey Regulatory Flexibility Act, N.J.S.A. 52:14B-16 et seq. The amendments are not expected to impose an undue hardship or new recordkeeping requirements, as the inclusion of soil gas removal systems in Group E buildings already occurs in the ordinary course of construction; the proposal merely seeks to update design techniques.

Housing Affordability Impact Analysis

The proposed rulemaking addresses radon hazard protective features for Group E buildings only. It would not have an impact on housing production costs or affect affordability.

Smart Growth Development Impact Analysis

The proposed amendments address radon hazard protective features for Group E buildings only and would not have any impact upon housing production within Planning Areas 1 and 2, or within designated centers, under the State Development and Redevelopment Plan.

Racial and Ethnic Community Criminal Justice and Public Safety Impact

The Department has evaluated this rulemaking and determined that it will not have an impact on pretrial detention, sentencing, probation, or parole policies concerning adults and juveniles in the State.

Full text of the proposal follows (additions indicated in boldface **thus**; deletions indicated in brackets [thus]):

SUBCHAPTER 10. RADON HAZARD SUBCODE

5:23-10.2 Definitions

The following words, terms, and abbreviations, when used in this subchapter, shall have the following meanings unless the context clearly indicates otherwise.

...

“Perforated pipe” means rigid plastic pipe that is a minimum wall thickness of Sewer and Drain ASTM D-2729, with at least a two-and-a-half-inch diameter hole every five feet of piping set approximately 120 degrees apart.

...

“Radon collection mat” means an under slab prefabricated material specifically made to create a lateral void space under a slab to allow water or air to pass through it.

...

“Soil gas vent pipe” means a gas- and water-tight pipe not less than three to four inches in diameter that is routed from perforated pipe or radon collection mats (or equivalent approved method) to an approved location outside the building.

...

5:23-10.3 Enforcement

(a) (No change.)

(b) Enforcement responsibility shall be divided among subcode officials in the following manner:

1. Plan review and inspection with regard to compliance with N.J.A.C. 5:23-10.4(b) **and** (c) shall be the responsibility of the building subcode official, except that N.J.A.C. 5:23-10.4[(b)14](b)13 **and** (c)14 shall be the responsibility of the electrical subcode official; **and**
2. (No change.)

5:23-10.4 Construction techniques

(a) (No change.)

(b) Group E buildings: The construction techniques set forth in this subsection shall be the minimum radon hazard protective features required to be incorporated into construction of buildings in tier one areas, and may be incorporated elsewhere, in order to minimize radon and radon progeny entry and facilitate any postconstruction radon removal that may be required. Enumeration of these construction techniques is not intended to preclude voluntary use of additional or more extensive techniques. Full compliance with these construction techniques is not required for additions; however, those construction techniques that are feasible shall be incorporated.

1. **A base course in accordance with Section 1805.4.1 of the building subcode shall be installed below slabs and foundations. There shall be a continuous base course under each soil gas vapor barrier that is separated by foundation walls or footings. Punctures, tears, and gaps around penetrations of the soil gas vapor barrier shall be repaired or covered with an additional soil gas vapor barrier.**

- i. The soil gas vapor barrier shall be a continuous 6-mil (0.15 mm) polyethylene or an approved equivalent.
 - ii. Approved alternative soil gas collection areas, such as sealed crawlspaces, shall be permitted.
2. Foundation walls and floors in contact with the soil shall be damp-proofed or waterproofed in accordance with Section 1805 of the building subcode.
3. There shall be an unobstructed path for soil gas flow within the base course and out through the vent in the roof.
4. Soil gases below the foundation shall be collected by a perforated pipe with a diameter of not less than four inches (10 cm) and not less than 10 feet (3 m) in total length that is mechanically fastened to a “T” pipe with two horizontal openings within the base course for radon collection or an equivalent method.
 - i. The “T” pipe fitting connection within the base course and the soil gas vent pipe that extends to the roof shall be designed to prevent clogging of the radon collection path.
 - ii. Alternately the soil gas collection shall be by approved radon collection mats or an equivalent approved method.
5. Openings in slabs, soil gas vapor barriers, and joints, such as plumbing, ground water control systems, soil gas vent pipes, piping, and structural supports, shall be sealed against air leakage at the penetrations with a polyurethane caulk, expanding foam, or other approved sealing method.

6. Gaps, seams, and joints below grade in walls and footings that surround soil gas collection areas shall be closed with cementitious materials, damp-proofing, or other approved products.

7. Closure shall be provided to prevent air migration between the base course that serves soil gas collection and the foundation drain systems located outside of the walls or footings that surround the soil gas collection areas.

8. Masonry unit walls below grade shall provide a barrier between soil gas and interior spaces. Barriers shall include, but not be limited to, closure of openings within the hollow masonry units, full grouting, solid masonry units, or other approved method.

9. A sump cover that substantially closes off the soil gas entry routes shall be provided for all sump installations.

10. Sumps intended for ground water control shall have gasketed lids or be otherwise sealed and shall not be connected to the soil gas exhaust system.

11. Vent pipes shall connect to a single vent that terminates at least 12 inches above the roof. If the design requires multiple individual vent pipes, they shall terminate separately at least 12 inches above the roof. Alternatively, vent pipe termination from the soil gas permeable layer shall extend to at least 30 feet above grade. In addition, vent pipes shall meet the following:

i. The vent pipe shall terminate no less than four feet vertically above or 10 feet horizontally away from operable windows, doors, or skylights.

ii. The vent pipe shall be sloped to avoid collecting condensate or rainwater.

iii. The vent pipe size shall not be reduced at any location as it goes from gas collection to the roof.

iv. Exposed and visible interior vent pipes shall be identified with not less than one label reading "Radon Reduction System" on each floor and in habitable attics.

v. The minimum vent pipe diameter and maximum area vented per vent pipe shall be as specified in Table 11 below.

vi. Multiple sub-slab areas that are segregated and combined into a single vent pipe shall be subject to minimum vent pipe diameter and maximum area vented per vent pipe specifications in Table 11 below.

TABLE 11

Maximum Vented Foundation Area

| Maximum Area Vented | Minimum Pipe Diameter |
|---|-----------------------|
| 2,500 ft ² (232 m ²) | 3 inch (7.6 cm) |
| 4,000 ft ² (372 m ²) | 4 inch (10 cm) |
| Unlimited | 6 inch (15.2 cm) |

12. In buildings that have interior footings or other barriers that separate the soil gas permeable layer, each area shall be fitted with an individual vent pipe.

13. Each radon vent pipe shall have an electrical junction box installed within six feet of the area where a future radon fan may be installed.

[(b)] (c) **Group R buildings:** The construction techniques set forth in this subsection shall be the minimum radon hazard protective features required to be incorporated into construction of buildings [in Use Groups E and R] in tier one areas, and may be incorporated elsewhere, in order to minimize radon and radon progeny entry and facilitate any post-construction radon removal that may be required. Enumeration of these construction techniques is not intended to preclude voluntary use of additional or more extensive techniques. Full compliance with these

construction techniques is not required for additions; however, those construction techniques that are feasible shall be incorporated.

1. – 16. (No change.)